Initial Treatment of Hypertension

- Goals of and Benefits of Therapy
- JNC 7 Rx Algorithm / Anticipating JNC 8
- Lifestyle (brief overview)
- Case Presentation
- ACCOMPLISH

Blood Pressure Classification

BP Classification	SBP mmHg		DBP mmHg
Normal	<120	and	<80
Prehypertension	120–139	or	80–89
Stage 1 Htn	140–159	or	90–99
Stage 2 Htn	≥160	or	≥100

Classification and Management of BP for adults

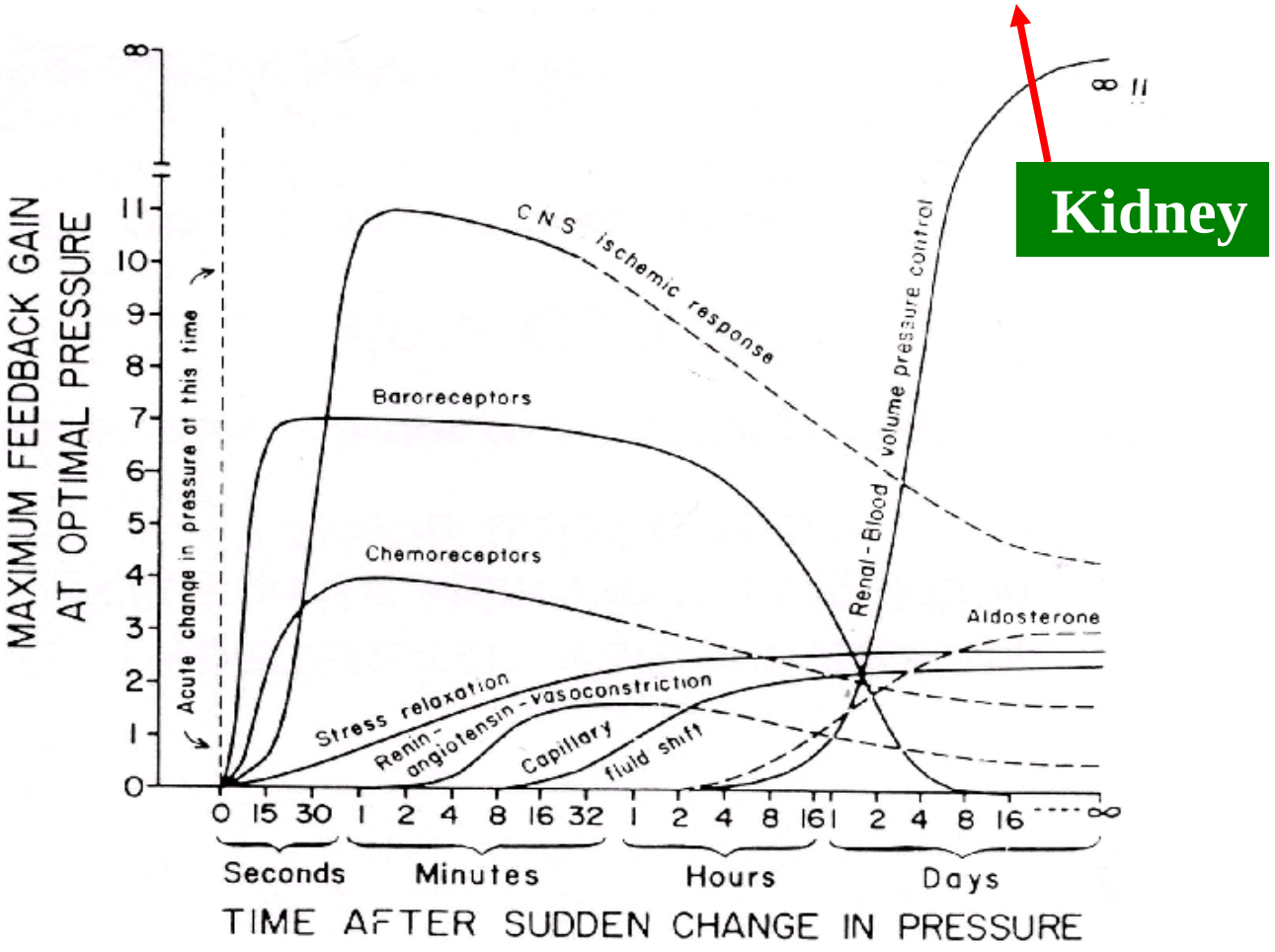
BP classification	SBP mmHg	DBP mmHg	Lifestyle change	Initial drug therapy	
				Without compelling indication	With compelling indications
Normal	<120	and <80	Encourage		
Pre-HTN	120–139	or 80–89	Yes	No antihypertensive drug indicated.	Drug(s) for compelling indications. ‡
Stage 1 Hypertension	140–159	or 90–99	Yes	Thiazide-type diuretics for most. May consider ACEI, ARB, BB, CCB, or combination.	Drug(s) for the compelling indications.‡ Other antihypertensive drugs (diuretics, ACEI, ARB, BB, CCB) as needed.
Stage 2 Hypertension	≥160	or ≥100	Yes	2-drug combination for most† (usually thiazide-type diuretic and ACEI or ARB or BB or CCB).	

†Initial combined therapy should be used cautiously in those at risk for orthostasis.
‡Treat patients with chronic kidney disease or diabetes to BP goal of <130/80 mmHg.

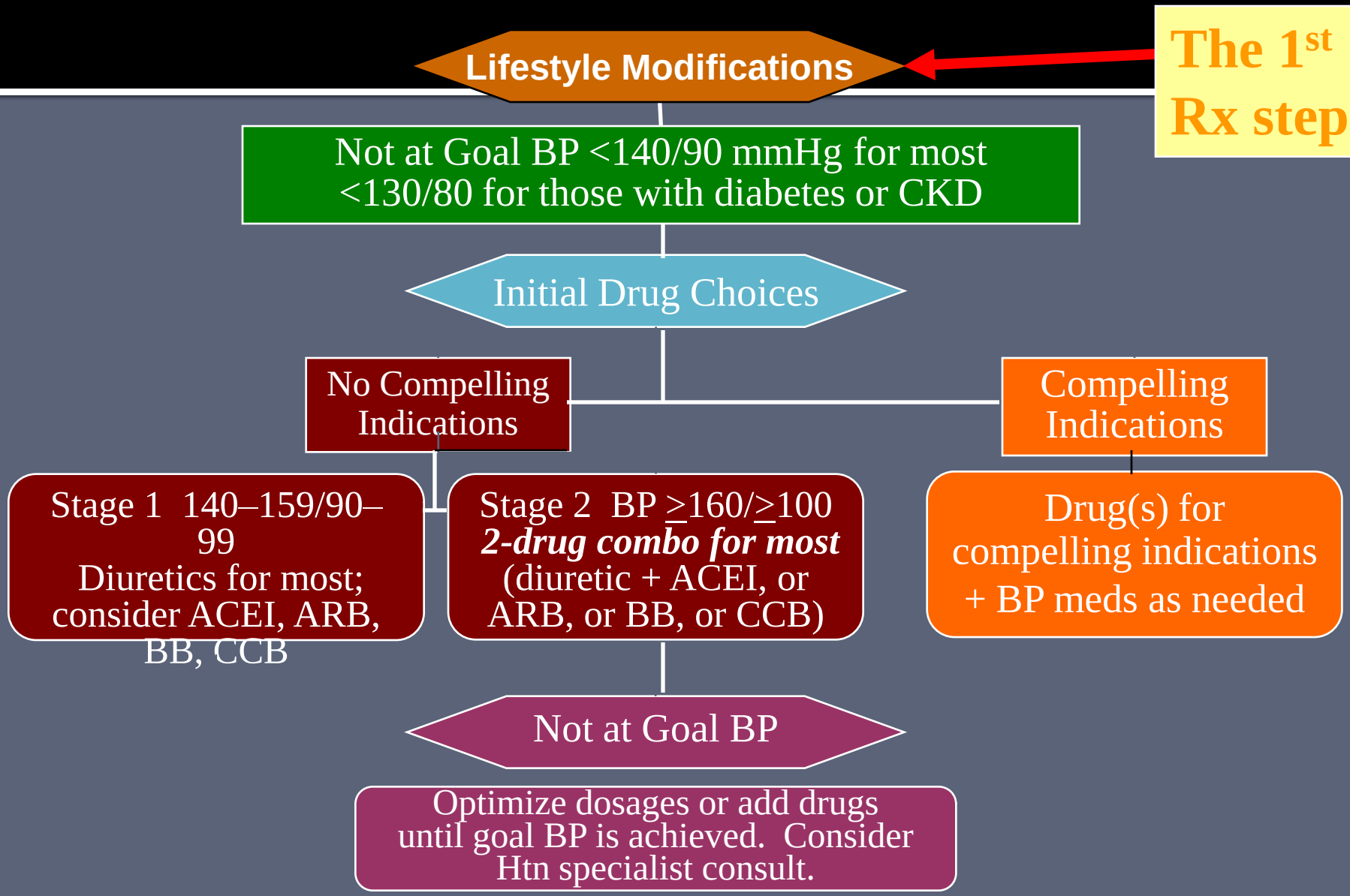
Goals of Therapy

- Reduce CVD and renal morbidity & mortality.
- Treat to BP <140/90 mmHg or BP <130/80 mmHg in patients with diabetes or CKD.
- Achieve SBP goal especially in persons ≥50 years of age.

The Kidney is the Dominant Long-Term Regulator of Arterial Blood Pressure



Algorithm for Treating Hypertension



Lifestyle Modification

Modification	Approx. SBP reduction
Weight reduction	5–20 mmHg/10 kg weight loss
DASH eating plan	8–14 mmHg
Reduce sodium	2–8 mmHg
Physical activity	4–9 mmHg
Moderate alcohol	2–4 mmHg

JNC 7 Compelling Indications

	Diuretic	βB	ACEI	ARB	CCB	AA
Heart failure	✓	✓	✓	✓		✓
Post-MI		✓	✓	(√)		✓
High CAD risk	✓	✓	✓		✓	
Diabetes	✓	✓	✓	✓	✓	
Chronic kidney disease			✓	✓		
Recurrent stroke prevention	✓		✓			

Chobanian AV et al. *JAMA* 2003;289:2560-2572.

JNC 7: Key Treatment Messages

- Thiazide-type diuretics should be initial drug therapy for most, either alone or combined with other classes.
- Certain high-risk conditions are compelling indications for other drug classes.
- Most patients will require two or more antihypertensive drugs to achieve goal BP.
- If BP is ≥20/10 mmHg above goal, initiate therapy with 2 agents, 1 usually should be a thiazide diuretic.

Case Presentation #1: Elderly Hypertensive

- Hx. You are seeing Mrs. E. Jones for the 1st time. She is a 68 y/o AAF who cared for her husband during an extended terminal illness. She ran out of little 'blue pills' for HTN 6 months ago. She is asymptomatic and has no h/o CVD, CKD, diabetes, or ↑ cholesterol.
- Exam: WDWN AAF BMI 26.9 WC 35" BP 162/98 Gr 1 /2 KW; no bruits, lungs clear, no ES, no edema
- Plan: You decide to instruct the patient on home BP monitoring; recommend DASH Eating Plan, walking 20 min daily; order lab tests; RV 2 wk

Case Presentation #1: Elderly Hypertensive

- RV 2 wks: Mrs. EJ is feeling well, likes DASH , and has been walking 30 minutes daily. Her home BP, taken twice daily, averages 152/88
- Exam: BMI unchanged BP 156/92
- Lab: K+ 4.3 Creat 1.4 (eGR 48) TC 208 TG 78 HDL 52 LDL 140 alb/creat 32 ECG LVH (voltage)
- Plan: Mrs. EJ agrees to continue DASH and her walking program. You provide further counseling and develop a management plan with her.

Case Presentation #1: Elderly Hypertensive. Questions.

- How would you classify Mrs. EJs hypertension?
  1. Normal
  2. Pre-hypertension
  3. Stage 1
  4. Stage 2
  5. Too early to classify; more data required

Case Presentation #1: Elderly Hypertensive. Questions

- What is her BP goal?
  1. <120/<80
  2. <130/<80
  3. <130/<85
  4. <140/<90
  5. <160/<90

Goals of Therapy

- Reduce CVD and renal morbidity & mortality.
- Treat to BP <140/90 mmHg or BP <130/80 mmHg in patients with diabetes or CKD (eGFR <60 and/or albuminuria).
- Achieve SBP goal especially in persons ≥50 years of age.

Case Presentation #1: Elderly Hypertensive. Questions

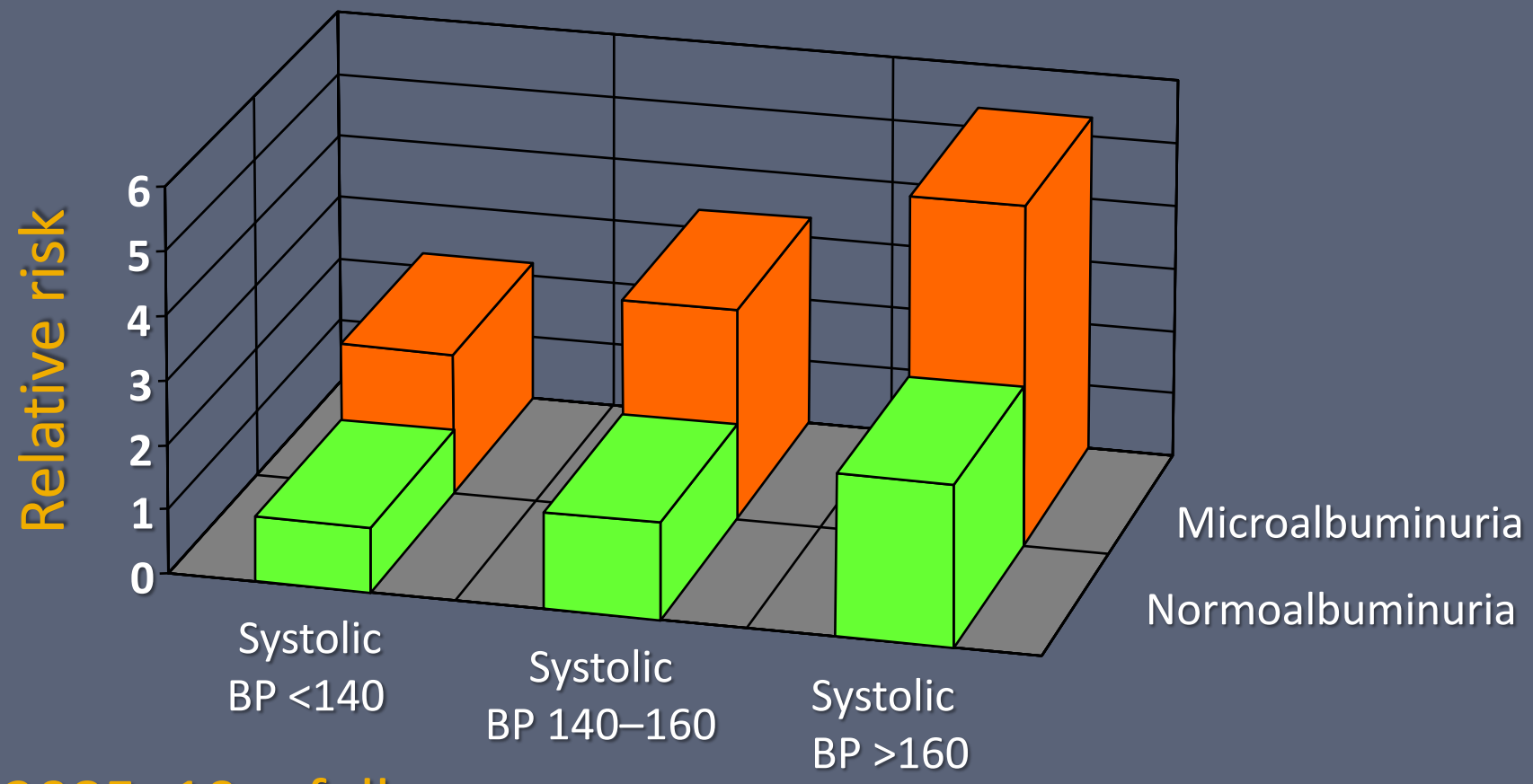
- What is Mrs. EJ 10-yr CHD risk (Framingham)
  1. <5%
  2. 5 – <10%
  3. 10 – 20%
  4. >20%
  5. Not enough data to calculate

Case Presentation #1: Elderly Hypertensive. Questions

- What are factors that could increase Mrs. EJs CHD risk beyond the Framingham calculation?

  1. CKD
  2. Microalbuminuria
  3. LVH by voltage
  4. Impaired fasting glucose
  5. All of the above

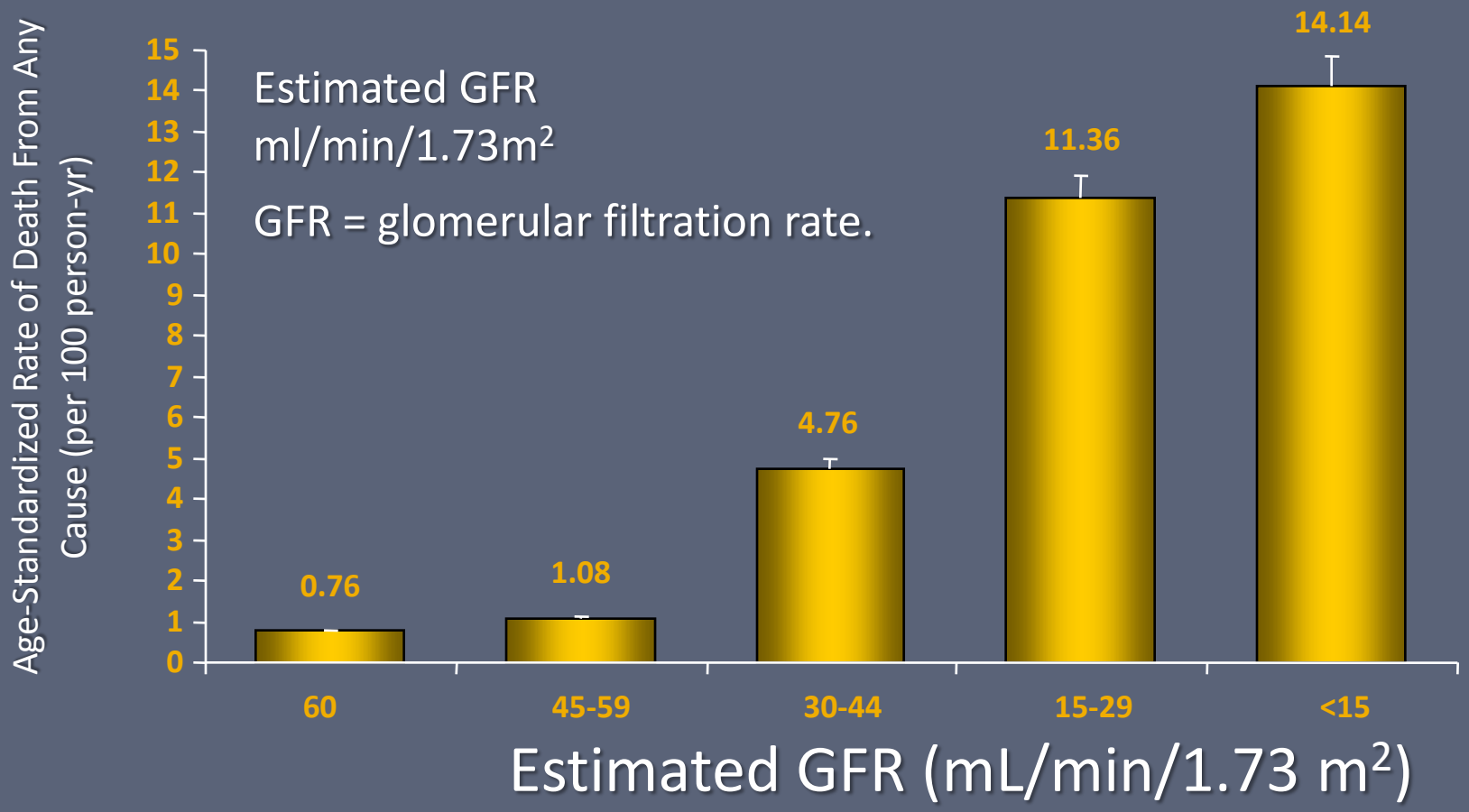
IHD Risk Is Related to Microalbuminuria and BP



N=2085, 10-y follow-up.

Borch-Johnsen et al. *Arterioscler Thromb Vasc Biol.* 1999;19:1992.

Relative Risk of Death per GFR Level



No. of Events	25,803	11,569	7802	4408	1842

Reproduced with permission from Go AS, et al. *N Engl J Med*. 2004;351:1296-1305.

Case Presentation #1: Elderly Hypertensive.

- Framingham CHD Risk Calculator concerns.

  Typically does not include:

  1. Microalbuminuria / proteinuria
  2. CKD (stages 3 – 5)
  3. LVH
  4. Impaired fasting glucose
  5. Waist circumference

Case Presentation #1: Elderly Hypertensive. Questions

- What would you select as initial therapy for treating hypertension in Mrs. EJ?
  1. HCTZ 25 mg daily
  2. Amlodipine 5 mg daily
  3. Benazepril 20 mg daily
  4. HCTZ 25 mg + Benazepril 20 mg daily
  5. Amlodipine 5 mg + Benazepril 20 mg daily

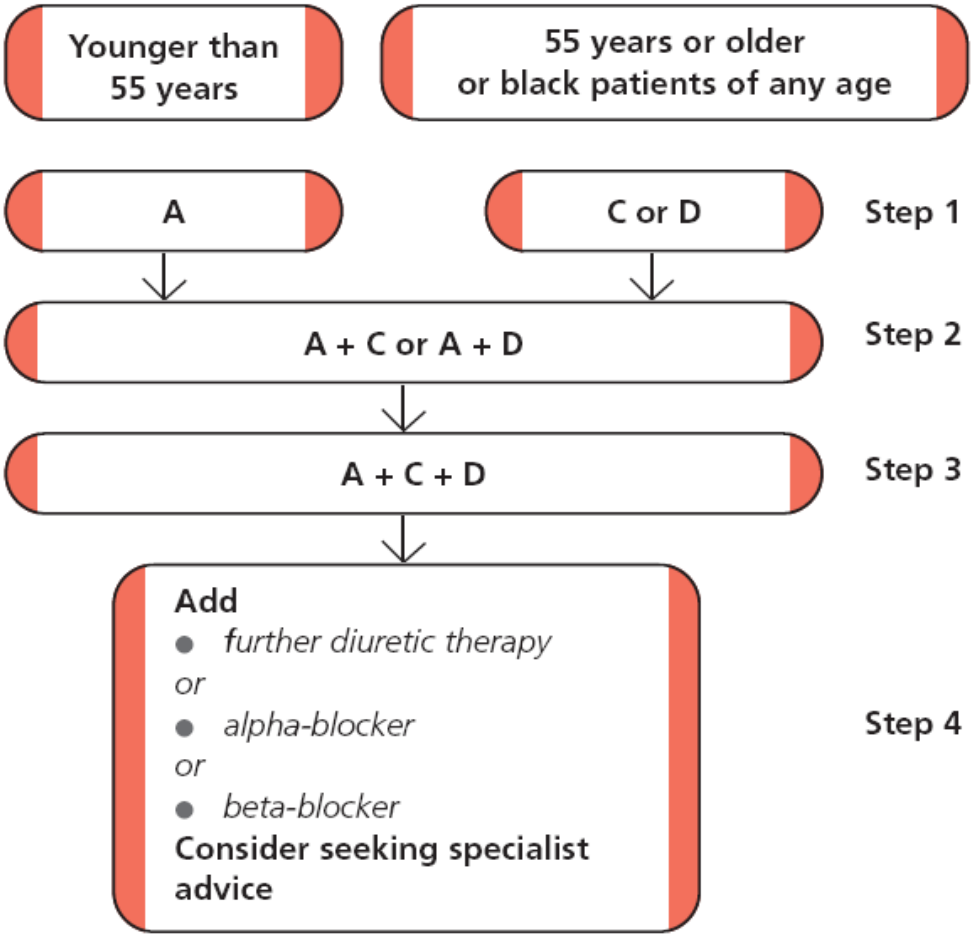
JNC 7: Key Treatment Messages

- Thiazide-type diuretics should be initial drug therapy for most, either alone or combined with other classes.
- Certain high-risk conditions are compelling indications for other drug classes.
- Most patients will require two or more antihypertensive drugs to achieve goal BP.
- If BP is ≥20/10 mmHg above goal, initiate therapy with 2 agents, 1 usually should be a thiazide diuretic.

Choosing drugs for patients newly diagnosed with hypertension

Abbreviations:
A = ACE inhibitor
(consider angiotensin-II receptor antagonist if ACE intolerant)
C = calcium-channel blocker
D = thiazide-type diuretic

Black patients are those of African or Caribbean descent, and not mixed-race, Asian or Chinese patients



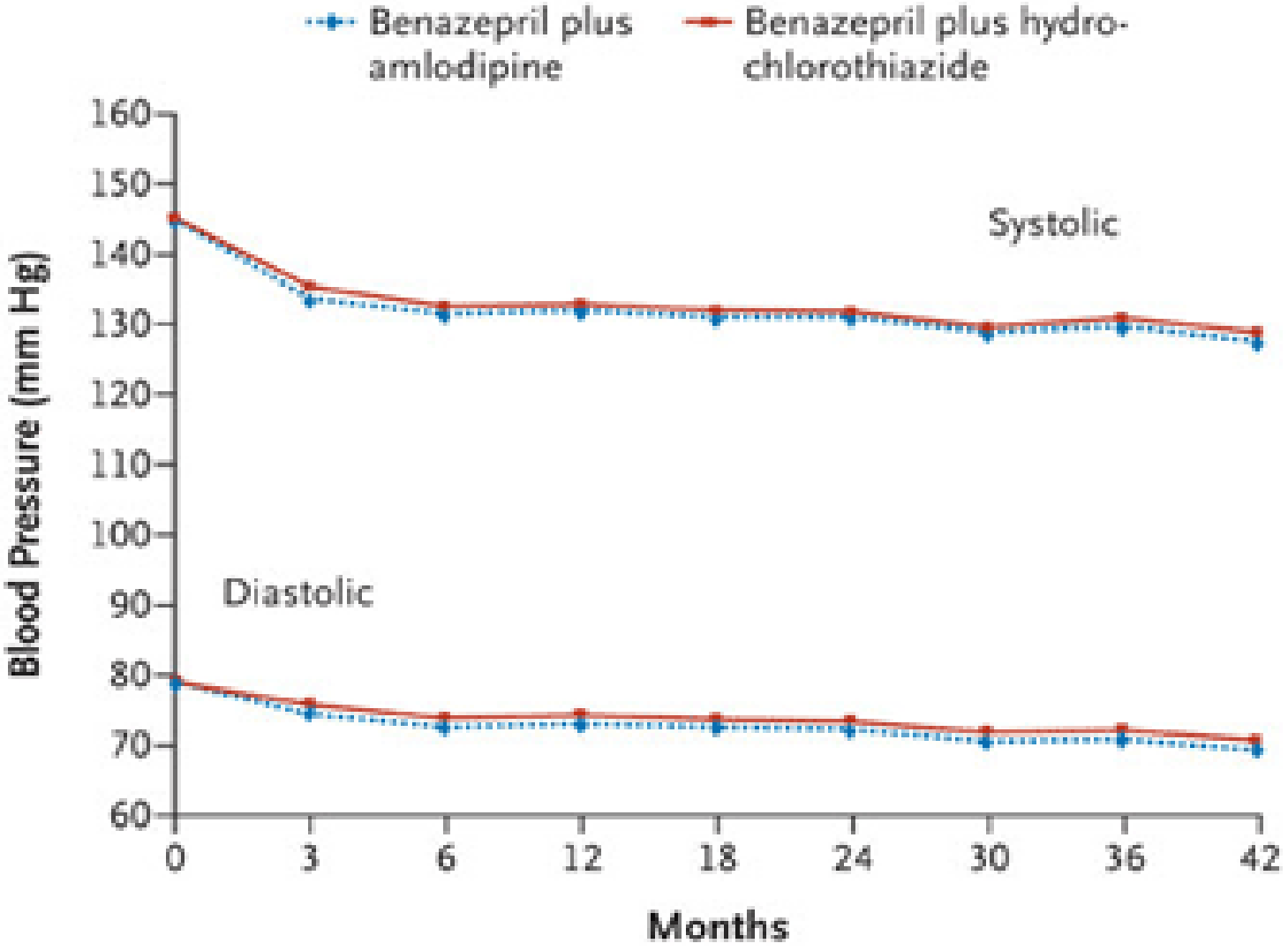
BHS

NHS
National Institute for Health and Clinical Excellence

Benazepril plus Amlodipine or HCTZ for Hypertension in High-Risk Patients

- *Methods* 11,506 high-risk HTN patients were randomized to benazepril+amlodipine or benazepril+HCTZ.
- *Results* BPs were 131.6/73.3 with ACEI–CCB and 132.5/74.4 with ACEI–HCTZ. There were 552 primary events with ACEI-CCB (9.6%) and 679 with ACEI–HCTZ (11.8%), HR, 0.80, p<0.001. For the secondary end point of death from CV causes, nonfatal MI, and nonfatal stroke, the HR was 0.79 (95% CI, p=0.002).
- *Conclusions* Benazepril+amlodipine was superior to benazepril+HCTZ in reducing CV events in high risk HTN.

Jamerson K, et al: NEJM 2008;359:2417.

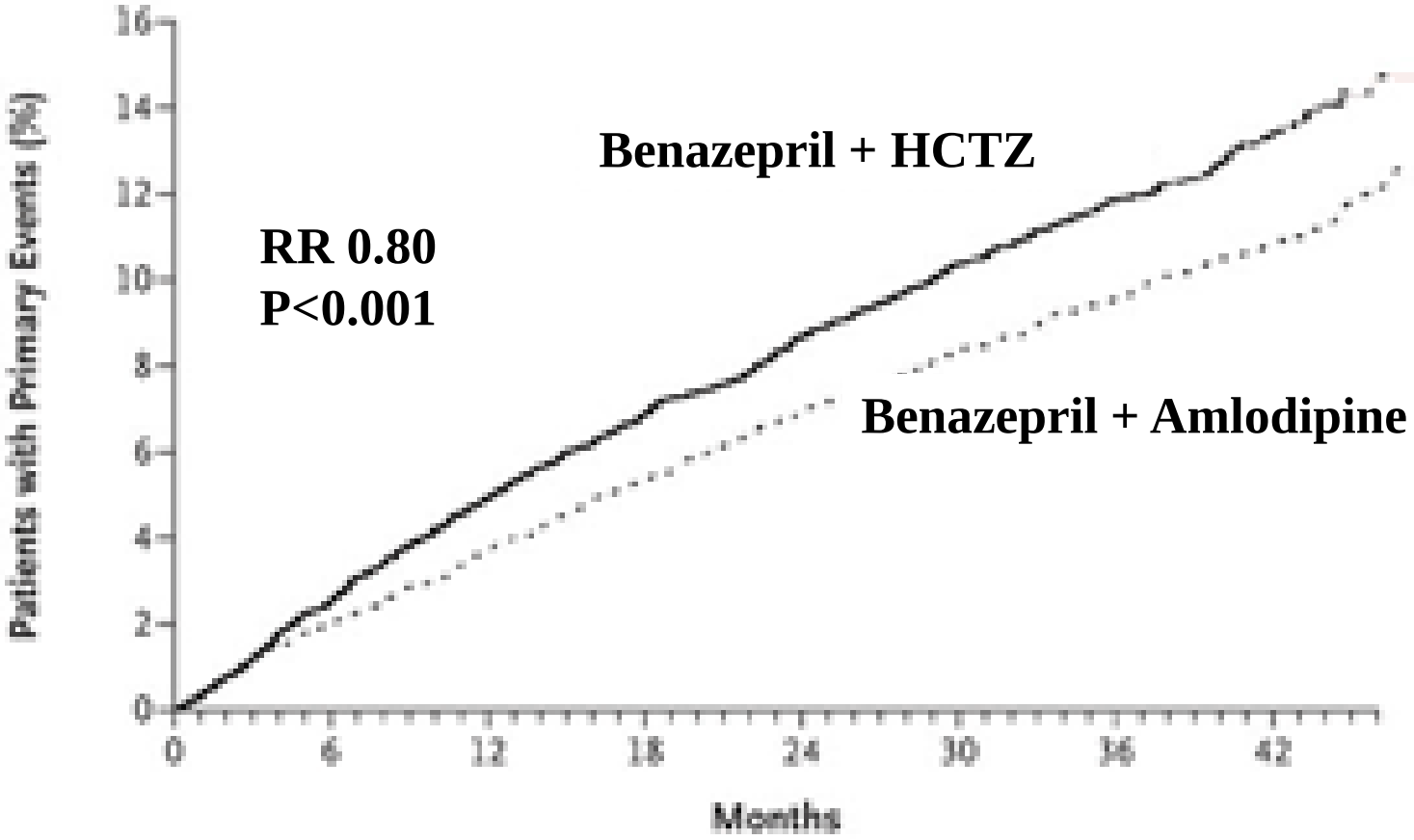


No. at Risk

Benazepril plus amlodipine	5740	5517	5404	5178	5010	4866	4298	2804	1074
Benazepril plus hydrochlorothiazide	5757	5537	5408	5222	5033	4825	4299	2529	1042

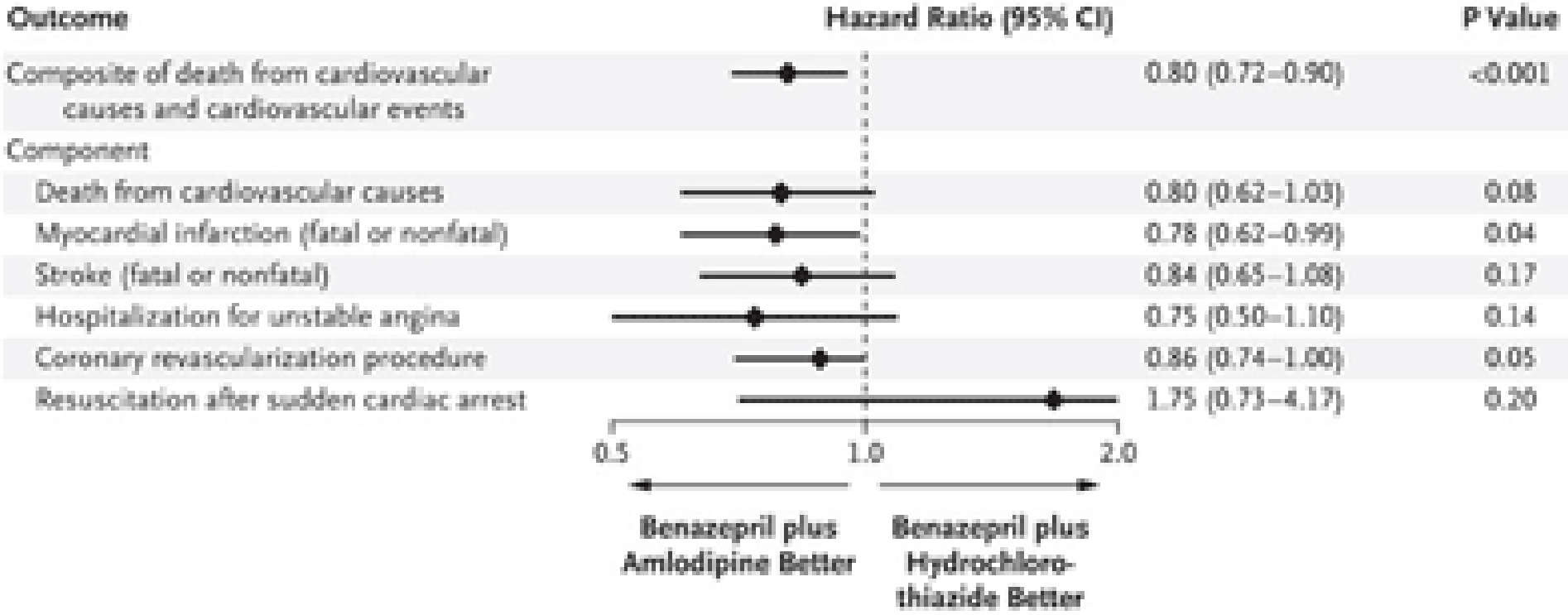
Jamerson K, et al: NEJM 2008;359:2417

ACCOMPLISH Time to Event



No. at Risk							
Benazepril plus amlodipine	5512	5317	5141	4959	4739	2826	1447
Benazepril plus hydrochlorothiazide	5483	5274	5082	4892	4655	2749	1390

ACCOMPLISH Primary Outcomes



ACCOMPLISH Adverse Events

Table 3. Results of Prespecified Safety Analysis.*

Adverse Event	Any		Serious		Drug-Related Serious	
	Benazepril–Amlodipine Group (N=5744)	Benazepril–Hydrochlorothiazide Group (N=5762)	Benazepril–Amlodipine Group (N=5744)	Benazepril–Hydrochlorothiazide Group (N=5762)	Benazepril–Amlodipine Group (N=5744)	Benazepril–Hydrochlorothiazide Group (N=5762)
	number (percent)					
Dizziness	1189 (20.7)	1461 (25.4)	18 (0.3)	31 (0.5)	2 (<0.1)	5 (0.1)
Peripheral edema	1792 (31.2)	772 (13.4)	10 (0.2)	8 (0.1)	4 (0.1)	2 (<0.1)
Dry cough	1177 (20.5)	1220 (21.2)	7 (0.1)	7 (0.1)	3 (0.1)	3 (0.1)
Angioedema	53 (0.9)	34 (0.6)	7 (0.1)	13 (0.2)	2 (<0.1)	5 (0.1)
Hyperkalemia	34 (0.6)	33 (0.6)	10 (0.2)	11 (0.2)	6 (0.1)	6 (0.1)
Hypokalemia	3 (0.1)	17 (0.3)	2 (<0.1)	12 (0.2)	1 (<0.1)	0
Hypotension	142 (2.5)	208 (3.6)	22 (0.4)	30 (0.5)	6 (0.1)	9 (0.2)

* Safety data were ascertained on the basis of reports by participants or investigators, discovered on physical examination or report by the central laboratory.

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